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10/589,274	04/11/2008	Jin Ho Song	1455-062312	5731

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EXAMINER
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PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3663

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,274	<b>Applicant(s)</b> SONG ET AL.	
	<b>Examiner</b> Rick Palabrica	<b>Art Unit</b> 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/5/10 and 10/22/09 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's 4/5/10 submission, which amended the specification, submitted a replacement drawing, directly amended claims 1 and 7, and traversed the rejection of claims in the 1/5/10 Office action, has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to the art rejection of the claims have been considered but are moot in view of the new ground(s) of rejection.

3. Applicant argues that the amendment to Fig. 5 showing a coolant hole in dashed lines "generally indicate that the bottom surface may include a hole rather than indicating a specific location for the hole."

The examiner disagrees.

Dashed lines in a drawing represent elements or structures that are not directly visible but still disposed at the specific location where the dashed lines are shown. As

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stated in the previous Office actions, the as-filed specification discloses a generic location of this hole. Thus, the drawing introduces new matter, i.e., the specific location of the hole, and the drawing objection is maintained.

If applicant desires to introduce this new matter in the disclosure, applicant could consider filing a continuation-in-part application. Alternatively, applicant should cancel this new matter in the disclosure.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “an outer retention vessel having at least one coolant hole formed in a bottom thereof,” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The amendment filed on 4/5/10 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The proposed amendment to the specification shown underlined on page 2 of the 4/5/10 submission.

Applicant is required to cancel the new matter in the reply to this Office Action.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the reactor vessel" in line 4. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over:

a) Rosewell (U.S. 4,310,385) alone or in view of either one of Kuljis et al. (U.S. 7,218,101) or Fife (U.S. 5,802,125); or b) Aburomia (U.S. 5,426,681; or c) Hwang et al. (U.S. 6,195,405) or Alsmeyer et al. (U.S. 6,658,077) in view of Tominaga et al. (U.S. 5,295,169).

Rosewell

Rosewell teaches an emergency melt down core catcher for a nuclear reactor (see Figs. 1-7).

As to claim 1, applicant's claim language reads on Rosewell as follows (e.g., see Fig. 2): a) "molten core retention tank" reads on the liner of pressure vessel 16; b) "compressed gas tank" reads on tank 41 having an outlet valve 46 and containing nitrogen or argon gas 67; c) "cooling water storage tank" reads on vessel 13 having cooling water 37"; d) "mixer including piping connecting to and extending from each of the compressed gas tank and cooling water storage tank" reads on the piping 39, piping below valve 46 and piping 22.

As to the limitations, "thereby mixing inert gas supplied from the compressed gas tank ..." and "thereby supplying the cooling water/inner gas mixture ...", the term

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“thereby” denotes a consequence or result of an action or a condition. Thus, Rosewell inherently meets this limitation because it meets the respective preceding conditions associated with said limitations.

The claims are also replete with statements that are either essentially method limitations or statements of intended or desired use. For example, “for passively cooling and retaining molten core material from a reactor”, “supplying inert gas”, “wherein steam generated ...” etc. These clauses, as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The system in the above cited reference (as well as in each of the below cited references) is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference.

For example, the liner in Rosewell is capable of retaining molten core material from the reactor vessel because core catching deposit 68 of eutectic material is provided on top of this liner, when required (see Fig. 3 and col. 4, lines 65+). The claim neither defines the amount nor physical characteristics (temperature, pressure, flow rate) nor retention time for the molten core material. Absent such definition, the examiner interprets said parameters broadly, and reads it on any and all molten core parameters that can be retained by the liner-eutectic material combination at any suitable time (e.g., one minute).

If applicant is of a different opinion that a liner is inherently present in Roswell's pressure vessel, then either one of Kuljis et al. or Fife teach(es) teach that it is old and advantageous to have this liner (see liner 24 in Fig. 2 of Kuljis et al. or liner 104 in Fig. 2 of Fife).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Rosewell, by the teaching of Kuljis et al. or Fife, to include a liner internal to the pressure vessel, to gain the advantages thereof (i.e., provide additional structural strength and thermal protection for the vessel), because such modification is no more than the use of a well known expedient within the nuclear art.

As to claim 7, applicant's claim language, "check valve", reads on reads on Rosewell's valve 38 at the outlet of tank 13.



Aburomia

As to claim 1, applicant's claim language reads on Aburomia as follows (e.g., see Fig. 1): a) "molten core retention tank" reads on the containment sump beneath pressure vessel 2; b) "compressed gas tank" reads on tank 24; c) "cooling water storage tank" reads on GDCS-LT 26"; d) "mixer including piping connecting to and extending from each of the compressed gas tank and cooling water storage tank" reads on the piping system connecting the pipe from tank 24 and the pipe from GDCS-LT 26 (see Fig. 2) .

The sump in Aburomia is capable of retaining molten core material from the reactor vessel. The claim neither defines the amount nor physical characteristics (temperature, pressure, flow rate) nor retention time for the molten core material. Absent such definition, the examiner interprets said parameters broadly, and reads it on any and all molten core parameters that can be retained by the sump at any suitable time (e.g., one minute).

As to the "inert gas", this is a material worked upon by the Aburomia apparatus. Alternatively, an inert gas is a well known expedient to pressurize an accumulator, and its use in the Aburomia apparatus would have been intuitively obvious to one of ordinary skill in the art at the time of the claimed invention. If applicant requires a teaching on said inert gas for an accumulator, see Kleimola (U.S. 3,984,282) at col. 19, lines 55+.

As to the mixing of the inert gas with the cooling water, note that in the event of an accident that results in failure of pressure vessel 2 in Aburomia, gas from tank 24 will flow through the break in the pressure vessel and mix with the cooling water from

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GDCS-LT 26, and the mixture will settle in the sump, which mixing and settling cannot be prevented.

As to claim 7, see Fig. 1 showing a check valve at the outlet of GDCS-LT 26.

Hwang et al. or Alsmeyer et al. in view of Tominaga et al.

As to claim 1, Hwang et al. or Alsmeyer et al. disclose the applicant's claims except for the compressed gas tank. Both references teach an apparatus for catching and cooling a core melt.

Applicant's claim language reads on Hwang et al. as follows (see Fig. 7): a) "molten core retention tank" reads on gap structure 3; c) "cooling water storage tank" reads on water reservoir 15.

Applicant's claim language reads on Alsmeyer et al. as follows (see Fig.): a) "molten core retention tank" reads on the sump structure beneath pressure vessel 8; c) "cooling water storage tank" reads on water reservoir 9 (see col. 4, lines 26+),

Tominaga et al. teach that it is old and advantageous to have an emergency water cooling system comprising a gravity-driven water tank 26 and an accumulator water tank 25 (see Fig. 1). The pipes at the outlet of both tanks are connected to a common pipe that supplies emergency cooling water.

Both primary and secondary references are in the same field of endeavor and reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the references

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are concerned with the problem of providing cooling water to a reactor system in the event of an emergency that could lead to degradation of the integrity of the core.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either one of Hwang et al. or Alsmeyer et al., by the teaching in Tominaga et al., to include an accumulator water tank (which has a compressed gas), to gain the advantages thereof (i.e., provide redundancy to gravity-driven water and increase the reliability of the emergency water cooling system), because such modification is no more than the use of a well known expedient within the nuclear art.

As to claim 7, see Fig. 7 in Hwang showing a check valve at the outlet of coolant reservoir. Such valve would also be advantageous if not inherent in Alsmeyer's coolant reservoir.

8. Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Alsmeyer et al. and Tominaga et al.

As to claims 2 and 3, applicant's claim language reads on the combination as follows: a) "porous protection vessel" reads on porous body 3 of Alsmeyer et al.; b) "gravel layer" reads on the inherent gravel component of the concrete layer (shown in dashed lines) beneath the underside 3a of porous layer 3 of Alsmeyer et al..

As to claim 5, this is a product-by-process claim that either of the two references meet as per MPEP 2113, which states:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

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from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966.

As to claim 6, applicant’s claim language, “screen layer” reads on Alsmeyer et al.’s seal 7, which screens porous body 3 from sacrificial material 6. Applicant has not defined the term, “screen”. Absent such definition, the examiner applies the ordinary meaning of the term, i.e., “protection” or “shield”, which is met by the seal in the above combination.

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aburomia

As to claim 8, applicant’s claim language, “intermediate storage tank” reads on PCC condenser that drains condensed water to the cooling water storage tank (i.e., GDCS-LT pool 26 (see Fig. 5 and col. 6, lines 3+).

As to claim 9, it would have been obvious to one of ordinary skill in the art to have added a filter to the PCC condenser, as part of good engineering practice, to prevent debris in the condensed water from falling into GDCS-LT pool.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rick Palabrica/  
Primary Examiner, Art Unit 3663

April 28, 2010